



US Army Corps  
of Engineers  
Office of the Chief  
of Engineers

# DCAF Bulletin

Design Construction Analysis Feedback

No. 96-02

Date: 26 February 1996 Expires 31 Dec 96

CEEC-CE

Subject: Construction

Applicability: Repetitive Observations on Built-up Roofing Construction (CEGS 07510, CEGS 07220, CEGS 07600, CEGS 06100)

## Information

**DISCUSSION:** The following observations have been noted by Design/Construction evaluation team members at different construction sites during the past two years. The observations are listed from the most repetitive to least repetitive. The design and construction requirements associated with the following observations are based on the Guide Specifications CEGS 07510 dated Feb 93, CEGS 07220 dated May 93, CEGS 07600 dated Oct 94 and CEGS 06100 dated Dec 93. Contract Specification should follow these Guide Specifications.

**OBSERVATION:** Roofing and insulation materials improperly stored.

**REQUIREMENT:** Storage requirements for roofing materials are specified in CEGS 07510, para. 1.3. Storage of felts, fabrics and roll roofing in an enclosed building or in a closed trailer is required. CEGS 07220, para. 1.4, requires that insulation, base sheet and felt be kept dry at all times, before, during, or after delivery to the site and if exposed to moisture, shall be permanently removed from the site.

**OBSERVATION:** Installation of insulation and roofing not complete in one continuous operation. Roof insulation left exposed to the elements.

**REQUIREMENT:** Paragraph 3.1.1 of CEGS 07510 requires that the entire roofing system, excluding flood coat and aggregate surfacing, shall be finished in one operation up to the line of termination at the end of a day's work. Glaze coating is used to waterproof completed sections when more than one day is required to finish the roofing. Phased construction is not permitted. CEGS 0750, para. 3.1.1, requires that roofing operations shall be coordinated with insulation work so that all roof insulation applied each day is waterproofed the same day. The procedure for sealing the terminated edge of built-up roofing is described in CEGS 07510, para. 3.13.

Prepared IAW AR 310-2. Issued by: Directorate of Engineering and Construction.

OBSERVATION: Roofing operations not coordinated with sheet metalwork so that flashings are installed to permit continuous roof surfacing operations the same day felts are installed.

REQUIREMENT: Guide Specification CEGS 07510, para. 3.1.2, requires that roofing operations be coordinated with sheet metalwork (CEGS 07600) so that sheet metal items are installed to permit continuous roof surfacing operations the same day felts are installed.

OBSERVATION: Wood cants and nailers not preservative-treated.

REQUIREMENT: Guide Specification CEGS 07510, para. 2.4, and CEGS 07220, para. 2.7, requires that wood cants and nailers be made of treated wood. These paragraphs refer to Section: Rough Carpentry (CEGS 06100) for specific requirements. CEGS 06100 states, in addition to type of treatment, that exposed areas of treated wood that are cut or drilled after treatment shall receive a field treatment in accordance with AWP A M-4.

OBSERVATION: Bitumen being overheated. Kettles not provided with accurate working thermometers

REQUIREMENT: Paragraph 3.8 of CEGS 07150 states that asphalt shall not be heated higher than 24 degrees C (75 degrees F) above the EVT (Equiviscous Temperature) or 10 degrees C (50 degrees F) below the flash point or 274 degrees C (525 degrees F) (maximum) which ever is lower. Coal tar bitumen shall not be heated above 218 degrees C (425 degrees F). Heating kettles shall be provided with automatic thermostatic controls and an accurate thermometer.

OBSERVATION: Mechanical fasteners installed with less than required spacing. Fastener pull-out resistance does not meet specifications.

REQUIREMENT: CEGS 07510, para. 3.12, states that fasteners shall be spaced within 20 percent of the indicated spacing dimensions. There shall be no less than the total number of indicated fasteners in any 10 square meter (100 square feet) area. Fastener pull-out resistance shall not be less than 180 N (Newtons) (40 pounds) each.

OBSERVATION: Some sections have no aggregate applied, no glaze coat applied and felts exposed to the sun.

REQUIREMENT: CEGS 07510, para. 3.14, requires that after roofing felts have been laid and flashings installed the roof surface shall be uniformly flood-coated with specified bitumen and while bitumen is hot aggregate surfacing materials shall be embedded. Paragraph 3.17 states that if there is a probability of rain falling on the felts before flood coat and aggregate can be applied, a light glaze coat of bitumen, 0.49 kg to 0.73 kg per square meter (10 to 15 pounds per square), shall be applied over the exposed felts. The glaze coat may be considered as part of the flood coat provided the surfacing operation is completed within 48 hours after application of the glaze coat. Where glaze coat is used, surface treatment shall be completed as soon as weather conditions permit.

OBSERVATION: Roof insulation being installed in two layers. Joints are not being staggered properly and joints falling over flutes in desk.

REQUIREMENT: Guide Specification CEGS 07220, para. 3.7, requires that end joints be staggered and that long edge joints bear on surface of the steel deck.

SOLUTION: A thorough discussion of the contract specification requirements is a very important part of the preparatory phase. These repetitive observations should be discussed at the preparatory. The contractor must be required to provide materials that comply with contract specifications, proper storage of materials, suitable equipment with working thermometers, and coordination of various activities to permit continuous roofing operations. At the initial phase and through daily follow-ups the work must be checked to insure that these repetitive deficiencies as well as other items of non-compliance do not occur. Roofing operations are a critical part of the construction effort and as such, daily QA inspection is not only justified it is required. Under Air Force contracts there is the requirement of 100 percent inspection of the roofing operation.

Remember "moisture is the enemy" so keep insulation, felts, fabrics and roll roofing dry.



CHARLES R. SCHROER  
Chief, Construction Division  
Directorate of Military Programs.